

What is claimed is:

1. A process for separating one or more members selected from the group consisting of C₄₋₈ diolefins and C₆₋₁₂ aromatic hydrocarbons which are unsubstituted or substituted by up to three C₁₋₈ alkyl radicals from a mixture comprising at least one of said members and at least one other hydrocarbon comprising contacting said mixture with a copper or silver complexing compound in a nitrogen containing ionic liquid having a melting temperature below 80°C to preferentially take said one or more members into said ionic liquid, separating said ionic liquid from said at least one other hydrocarbon and regenerating said ionic liquid and releasing said at least one member.
2. The process according to claim 1, wherein the copper or silver complexing compound is selected from the group consisting of silver acetate, silver nitrate, and silver tetrafluoroborate and mixtures thereof.
3. The process according to claim 2, wherein in said ionic liquid the organic component is a heterocyclic nitrogen-containing aromatic compound.
4. The process according to claim 3, wherein said heterocyclic nitrogen containing aromatic compound is a C₅₋₈ nitrogen containing aromatic compound which is unsubstituted or substituted by up to three C₁₋₈ alkyl radicals.

5. The process according to claim 2, wherein said nitrogen-based ionic liquid is a nitrogen containing tetrafluoroborate ionic liquid.
6. The process according to claim 5, wherein said ionic liquid is selected from the group consisting of imidazolium and pyridinium ionic liquids which are unsubstituted or substituted by up to two C₁₋₈ alkyl radicals.
7. The process according to claim 6, wherein said ionic liquid is selected from the group consisting of 1-butyl-3-methylimidazolium tetrafluoroborate and 4-methyl-N-butylpyridinium tetrafluoroborate.
8. The process according to claim 7, wherein said mixture is in the gas or liquid state.
9. The process according to claim 8, wherein said regeneration of ionic liquid and said releasing of at least one member is effected using one or more treatments selected from the group consisting of increasing temperature, decreasing pressure, and passing an entraining gas through said ionic liquid.
10. The process according to claim 9, wherein said mixture and said ionic liquid are contacted in a counter-current flow.

11. The process according to claim 9, wherein said mixture and said ionic liquid are contacted in co-current flow.
12. The process according to claim 9, wherein said mixture and said ionic liquid are contacted in a continuous stirred tank reactor.
13. The process according to claim 1, wherein in the ionic liquid optionally contains from 0 to 15 volume % of water.
14. The process according to claim 6, wherein in the ionic liquid optionally contains from 0 to 15 volume % of water.
15. The process according to claim 7, wherein in the ionic liquid optionally contains from 0 to 15 volume % of water.